

NuclearFuel



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U.S. UTILITIES COME OUT HARD AGAINST URANIUM IMPORT BARS

The Edison Electric Institute is fighting to avoid any stiffening or reimposition of the embargo on use of foreign uranium in U.S. reactors, contending that it would hurt, rather than help, the domestic uranium industry by making nuclear power economically less attractive to utilities. An embargo or continued restriction on how much foreign uranium may be enriched in the U.S. for use in U.S. reactors would only lead to "unnecessarily higher costs of nuclear-generated electricity," EEI said.

In a letter to Sen. Pete Domenici (R-N.M.), John Kearney, a senior vice president at EEI, said that based on the planned lifting by 1984 of any restrictions on the use of foreign uranium in U.S. reactors "many electric utilities operating nuclear reactors hold long-term contracts with foreign uranium producers and are planning to deliver greater amounts of foreign uranium for enrichment in the future. Due to the condition of the market, an embargo at this time will not immediately help domestic producers. In the longer term the result will be artificially higher uranium prices which will unnecessarily raise the cost of electricity produced by nuclear energy — a cost that will be passed on to consumers.

"Generally speaking," he said, "the electric utilities take the position that there is nothing wrong with the domestic uranium industry that a healthy utility industry will not correct. Unnecessarily higher costs of nuclear-generated electricity will work against the President's plan to increase the use of nuclear energy and rejuvenate the nuclear industry."

The letter concluded: "We most urgently request that you do not take any action that might affect the uranium market until the (Senate Energy & Natural Resources) Subcommittee (on Energy Research & Development) can develop a full record on the subject by receiving information from the electric utilities."

NRC FAULTS TOKAI AGREEMENT FOR DELETIONS ON SAFEGUARDS AND PLUTONIUM TRANSFERS

Despite last-minute objections from NRC, U.S. officials Oct. 31 signed a new agreement permitting reprocessing of U.S.-origin spent fuel through 1984 at Japan's 210-tonne/year pilot plant at Tokai Mura.

The agreement was unveiled Oct. 29 at a hearing before the House Foreign Affairs Subcommittee on International Economic Policy & Trade. Unlike earlier agreements which limited the amount of fuel to be reprocessed (NF, 20 July, 15), the new pact permits operation of the plant at its full capacity. And to the chagrin of the NRC commissioners, it also lacks statements on safeguards and retransfers which earlier agreements contained.

NRC has several concerns with the new pact, NRC Chairman

Nunzio Palladino told the subcommittee. Several technical issues regarding safeguards at the facility are unresolved, he said. "The commission would have preferred a more comprehensive analysis by DOE of the technical effectiveness of safeguards issues," he said, urging that "vigorous efforts be made to resolve these issues before reaching agreement with Japan on a permanent solution to the reprocessing question."

Also, Palladino continued, the agreement should have retained "the statement that no determination was being made as to whether safeguards can be effectively applied to Purex reprocessing plants." This statement is necessary, he said, "to avoid future misunderstandings with Japan or other countries with which we have agreements which require joint determinations before reprocessing." The statement "was removed from the agreement during the most recent negotiations," he said.

And the agreement is ambiguous on end use of separated plutonium, Palladino said. The agreement says simply that Japan "intends" to use the mixed-oxide fuel obtained from Tokai in its fast breeder and advanced reactor research and development programs; the statement that the fuel "will be used exclusively" in those programs, which was part of the original agreement signed in September 1977, was dropped. "This is of concern because the commission has relied in part on the previous language for assurance against retransfers outside of Japan of plutonium separated by Tokai Mura," Palladino said. "An explicit retransfer pledge (should) be secured as part of the permanent solution."

"Japan could not use this plutonium for any other purpose without first consulting with the U.S. This point has been made explicitly to them," the State Department's Harry Marshall told the subcommittee. The new agreement, Marshall continued, "acknowledges, but does not give an approval for, Japanese plans to proceed with a commercial-scale reprocessing plant. In this regard, Japan will exchange views with us as plans for the plant evolve. We expect them to design the facility to optimize the IAEA's ability to apply safeguards effectively."

Marshall stressed that the new agreement "does not constitute any determination as to whether safeguards can be effectively applied to the planned Japanese commercial-scale reprocessing plant." A consortium of about 100 Japanese companies have formed the Japanese Nuclear Fuel Service Co. Ltd. to build an 1,100-tonne/year plant by 1990 (NF, 19 Jan., 1).

"We recognize that the safeguards at Tokai Mura and elsewhere require continued improvement," Marshall continued. "Safeguarding reprocessing plants is not an easy task. . . . It is vitally important that effective and efficient means of safeguarding such facilities be developed and put into use by the IAEA. Thus, it is fortunate that Japan has operated the Tokai facility as essentially a test bed or laboratory for developing more effective and efficient techniques that may be applied in safeguarding reprocessing plants."

Asked whether the Reagan Administration plans to use its right of prior consent as leverage to encourage countries to cooperate with U.S. nonproliferation goals, Marshall responded that "while the U.S. may possess some leverage in exercising its consent rights, it is easy to overstate its importance. . . . The supplier nations with whom we trade in nuclear commerce include our most valued friends and allies in the world. They fully share our concern about nuclear proliferation. They may, however, take somewhat different approaches to the same end. Using the leverage provided by retransfer consent rights on a

case-by-case basis to coerce nations into meeting our nonproliferation conditions will rarely be effective."

— *Michael Knapik, Washington*

THE PRICE OF REPROCESSING HAS SOARED at Tokai Mura. For the first 99 tonnes of spent fuel reprocessed at the 210-tonne/year pilot plant, Japan's Power Reactor & Nuclear Fuel Development Corp. charged its six clients a fee of 80-million yen/tonne (about \$350,000/tonne). The next 200 tonnes will cost 135-million yen (about \$590,000) each to reprocess, however, as PNC aims to deliver a commercial-quality service and intends to recover its plant's construction and operating costs. And that 200 tonnes is all the reprocessing PNC will try to do through October 1983 despite an okay from the Reagan Administration to work U.S.-origin material to the plant's full capacity through 1984.

TOKAI MURA'S FIRST MIXED-OXIDE FUEL ASSEMBLIES have been loaded into the 165-Mw Fugen prototype heavy-water reactor at Tsuruga and should begin producing power this month. Japan's Power Reactor & Nuclear Fuel Development Corp. fabricated the 44 fuel bundles using plutonium recovered at its pilot reprocessing plant at Tokai.

VEPCO BUYS ON SPOT AT NEAR \$24.50 A POUND

The Virginia Electric & Power Co. (Vepco) has accepted an offer by a U.S. utility for 400,000 pounds of U3O8 at a price close to \$24.50 at the time of delivery next March and May, knowledgeable sources told NuclearFuel. The award was only recently made known and followed by just a few weeks the bid invitation. It is subject to negotiations and contract signing.

The transaction is a positive sign, according to one source, because it "indicates to me that Vepco thinks the Nuexco (spot) price will be higher than what they agreed to pay (at the time of deliveries). The alternative would have been to wait if they thought they could get a better deal." Another source disputed that assessment because he said Vepco had signed other spot market contracts in the recent past. However, he added that with the spot price having remained at \$23.50 for the past four months, "the market looks very stable. The longer it stays at \$23.50, the more it suggests we've reached the bottom . . . and it's got to stop going down before it goes up." But he added that he felt it would be quite a while before the price goes up "on a real (dollar) basis." — *Stephanie Cooke*

EDF ORDERS EXXON TEST FUEL ASSEMBLIES IN SECOND STEP TO DIVERSIFY SUPPLY

Electricite de France has bought four fuel elements from Exxon Nuclear in what an EDF official said is furtherance of the utility's interest in diversifying its sources of fuel supply. Societe Franco-Belge de Fabrication de Combustibles (FBFC) now makes nearly all PWR fuel for France, but West Germany's RBU has started delivering reload batches whose order followed upon a trial contract similar to Exxon's.

The EDF official said it is not possible to foresee whether still other fabricators might one day represent a significant

share of French supply. He said the decision to buy from Exxon is aimed at examining other fuel element technologies. "If you have been used to driving a Citroen and you want to try a Renault, you begin by buying one," said the official.

EDF began this diversification program about two years ago when it ordered through Kraftwerk Union four "precursor" fuel assemblies to be fabricated by the KWU-Nukem subsidiary Reaktor-Brennelement Union (RBU). These were delivered in May 1980 and tested in one of the Bugey reactors.

Subsequently, EDF ordered 13 reload batches (of 52 fuel elements each) from KWU, for Bugey-3 and -5 and for St. Laurent-des-Eaux B-1 and -2. The first of these was delivered earlier this year, the second will follow next month, the third one early in 1982, and so on.

Exxon has no commitment from EDF for any fuel beyond these first four assemblies, which are scheduled for delivery in 1983. An EDF source said the Exxon fuel has somewhat different pellets and assembly design than what EDF is used to and also has a "demountable" feature which permits easy access to the fuel.

The EDF official said the contracts with Exxon and KWU should be seen as part of French policy to diversify energy sources in as many ways as possible. He declined to indicate if other such contracts are being negotiated. A source said EDF was interested in "keeping a low profile" on this particular diversification, which takes a bit of business away from a majority French-held company.

SWISS END RUN OF CANADA'S EMBARGO IS SEEN AS 'PERFECTLY LEGAL AND LEGITIMATE'

A Swiss utility was able to circumvent Canada's embargo on uranium shipments to Switzerland by arranging a swap through a U.S. producer whose mill is 20% owned by the utility. With the transaction about 70% complete, Swiss sources disclosed that KKW (Kernkraftwerke) Goesgen-Daeniken signed a contract early this year allowing Gulf Minerals Canada Ltd. to trade 800,000 pounds of Canadian produced U3O8 with an equivalent amount produced in the U.S. by Energy Fuels of Denver.

The contract, to which Eldorado Nuclear is a party, enabled the Gulf uranium to be shipped to the U.S. without upgrading in Canada, which normally would be required. It also enabled the equivalent amount of U.S. uranium to be sent to Canada for conversion and returned to the U.S. for enrichment, with the final destination Switzerland.

Sources say there was nothing unusual in the transaction. "It was a very simple transaction," said one. In fact, since the embargo took effect in 1977, about half the tonnage owed by Canadian producers to Swiss utilities (totaling about 1,950 tons) has been traded to buyers in countries who agreed to the safeguards provisions announced by Canada in 1974. Orders for some 900 tons were terminated by mutual agreement (NF, 11 May, 11), according to Canadian government sources.

A Canadian source was surprised that terms of the transaction were disclosed and wondered if it was for the purpose of embarrassing Canada. There is a dilemma, he added, because "Canada's reliability as a trading partner has been undermined because of the embargo.

"It's all perfectly legal and legitimate," he added. Canada's requirement for converting Canadian-origin material at Eldorado was satisfied because the amount of U3O8 sent to the U.S. was replaced by an equivalent amount from the U.S., he said. At the same time, the government's safeguards embargo was legally satisfied because the conversion of the U.S. uranium was ordered by Energy Fuels on behalf of the Swiss, and the U.S. and Canada have an agreement for cooperation on nuclear safeguards.

"Conversion per se doesn't attract safeguards," he said. While the swap might be construed as an "end run," he added, as far as Canada is concerned the uranium "hasn't gone to a country with whom it doesn't have a safeguards agreement."

The 800,000 pounds destined for the 970-Mw Goesgen-Daeniken nuclear power plant is scheduled for fabrication in West Germany and will cover reloads in 1983 and 1984. KKW and Nordostschweizerische Kraftwerke (NOK) each own 20% of Energy Fuels' White Mesa mill in Blanding, Utah, an Energy Fuels source said.

POOR REPORTS ON NORTHERN TERRITORY MINING CITED BY ENVIRONMENTAL IMPACTS 'WATCHDOG'

The supervising scientist, watchdog over environmental impacts from uranium mining in the Northern Territory, has criticized local authorities and Queensland Mines Ltd.

In his annual report for 1980-81, R.M. Fry said the Northern Territory administration had been "tardy" in providing six monthly reports to the coordinating committee on the Alligator River Uranium Province. This, he said, had reduced his role to one of "observing and ascertaining" how developments were affecting the area.

The Northern Territory administration is responsible for check monitoring and inspections and for providing mining approvals to companies.

Fry said information made available by the Northern Territory was inadequate, and he was thus unable to determine the effectiveness of regulatory measures.

"A major shortcoming of their reports is the lack of clear definition of the authorities' own monitoring and inspection programs designed to ensure the validity of the companies' own monitoring programs and compliance by the companies with Northern Territory laws." However, Fry said his office is currently holding discussions with Northern Territory officials to rectify this situation.

Fry also said there were deficiencies in the environmental monitoring and assessment techniques adopted by Queensland Mines and its Nabarlek deposit.

Dust levels at the mine sometimes forced workmen to wear special protective gear, he said, which was an unacceptable practice "if continued for lengthy periods." Dust monitoring equipment should also be located better, he said.

Referring to a reported spill of water from the operation, Fry said the company had not made a prompt report on the incident, and in addition had made "generally unsatisfactory" assessments of the significance of the spill of contaminated water.

Fry expressed concern at the lack of radium analysis of water samples at the 3,000-tonne-per-year Ranger operation. He also has asked Queensland Mines to determine the extent

of mercury and arsenic contamination in surface and ground-water supplies in the area.

GAC SUPPLYING FUEL IN SETTLEMENT WITH I&M

Indiana & Michigan Electric, a subsidiary of American Electric Power, and General Atomic Co. have ended their six-year-old dispute over a nuclear fuel supply contract.

According to the utility, GAC agreed to supply the balance of U3O8 called for in the original contract — 655,000 pounds — and one fabricated reload for the Cook nuclear station at Birmingham, Mich. That original contract called for delivery of 3.4-million pounds of U3O8 and six fabricated reloads. GAC maintained it was excused from fulfilling the contract because of steep increases in the price of uranium and unavailability of uranium because of GAC's supply dispute with United Nuclear.

In return for receiving the balance of deliveries at the contract price, Indiana & Michigan agreed to cancel its claim to about \$16-million in damages previously awarded by a New Mexico state court against GAC. Another term of the settlement calls for GAC to waive any bonuses it would have received for superior fuel performance.

MARLINE FINDING URANIUM IN VIRGINIA BUT NOT SURE IT HAS COMMERCIAL QUANTITY

Marline Uranium Corp., a subsidiary of the New York-based Marline Oil Corp., has over the past several months quietly leased more than 50,000 acres and spent "a little over \$6-million" exploring for uranium in Virginia's Piedmont area, an informed source says. The company is near having to report its findings to stockholders and the Securities & Exchange Commission and can't disclose the findings publicly until that is done, the source says, but Marline has not determined yet that it holds "commercial quantities."

DOE estimates potential reserves of 11,300 tons U3O8 in the area, in its \$30/lb forward cost category. The area is broken into three sections. The first, called the Lovington granite gneiss, is a crystalline rock unit with reserves of some 2,000 tons (in the \$30/lb forward cost category) probably set in a vein type deposit and scattered anywhere from just below the soil to a depth of 4,500 feet, based on a DOE composite vein type deposit in the western U.S.

In addition there are several contact metamorphic zones, with reserves of 1,000 tons in Paleozoic granite plutons at depths of 50-450 feet, again based on a composite model of similar deposits in the western U.S. And finally, and "perhaps most favorable," according to a DOE source, are five Triassic basins where sandstone hosts may contain 8,300 tons U3O8 in the \$30/lb forward cost category. Depths in these type deposits range from 50-750 feet, averaging about 300 feet, DOE says.

DNA PEOPLE'S LEGAL SERVICES HAS DROPPED ITS LAWSUIT demanding a regional environment impact statement on uranium development in the San Juan Basin. The decision was based on an unfavorable ruling by a federal court last spring and on dramatically decreased uranium activity in

the area. The lawsuit was filed in 1978 by 90 DNA clients who claimed that the Bureau of Indian Affairs had violated the National Environmental Policy Act by failing to prepare an environmental statement on uranium development on Navajo, federal, and private land in the area. A federal court ruled early this year that regional impacts must be considered, but said site-specific impact statements could include them rather than requiring a regional statement. Former Interior Secretary Cecil Andrus had successfully argued that the government had no coordinated plan for developing uranium in the region, so no regional statement was necessary.

RANCHERS MAY GO TO MARKET NEXT YEAR FOR 1.5-MILLION POUNDS THROUGH 1983

Ranchers Exploration & Development Corp. will begin next year to purchase or lease 1.5-million pounds of U3O8 to cover its contracts with Gulf States Utilities and the Taiwan Power Co., unless the market rebounds to make it economical to supply the uranium from Ranchers' own holdings.

To date, the utilities have been supplied with uranium from the Johnny M mine in northwest New Mexico. Johnny M is jointly owned by Ranchers and the HNG Oil Co., a subsidiary of Houston Natural Gas; Ranchers says "commercial" reserves at Johnny M will be exhausted in mid-1982.

To allow Ranchers to supply the uranium from other sources, the contracts with Gulf States and Taipower were amended earlier this year. The 1976 agreement with Gulf States had been for delivery of 3-million pounds of U3O8 from Johnny M. As of June 30, the end of Ranchers' fiscal year 1981, 2.75-million pounds had been delivered. The average price during FY-81 was \$33/pound. In the amended agreement, delivery of the remaining 245,000 pounds is deferred until 1984, a new minimum price — about \$45/pound — is established, and Ranchers is allowed to obtain the uranium from any source.

The original contract with Taipower was signed Oct. 2, 1979 and called for total deliveries through 1983 of 2,002,000 pounds of U3O8. Deliveries started this year at a rate of about 60,000 pounds/month. Before the contract was amended, the price was \$40/pound. Under the amendment the minimum price for the remainder of 1981 is \$37/pound; for 1982, \$38/pound; and for 1983, \$39/pound. Ranchers says that based on the estimated remaining recoverable reserves at the Johnny M mine, about 1,250,000 of yellowcake will be obtained from other sources to fulfill the contract.

Mid-1982 will also bring an end to uranium exploration by Ranchers, which has been prospecting for uranium since the mid-1960s. Last year the company drilled about 100,000 feet seeking uranium in New Mexico and Colorado.

The company also expects mid-1982 to mark the opening of the trial and its suit against Kerr-McGee. Although Ranchers received almost \$2.5-million in royalties from Kerr-McGee last year, Ranchers wants a court to sort out the royalty provisions in the lease of its Ambrosia Lake holdings.

An end to that suit and fulfillment of its contracts with Gulf States and Taipower may well mark the end of Ranchers' uranium business. The company has stockpiled 163,000 tons of ore with an average U3O8 content of about 0.09%. The ore came from the Small Fry mine near Moab, Utah. Mining ceased there in August 1978 and Ranchers says it will not be resumed

nor milling arrangements found for the stockpiled ore "unless there is an improvement in uranium prices." And the Hope mine in northwest New Mexico, owned jointly by Ranchers and Chaco Energy, was shut down in June because its economic reserves were exhausted, Ranchers says.

COGEMA SHOPS U.S. UTILITY STORES

Cogema is shopping among U.S. utilities for low-priced uranium (either as U3O8 or UF6) and hopes to have some contracts signed by the end of the year, sources say. Negotiations are being handled by Numatec, the Washington-based North American representative for Cogema, Eurodif and other French nuclear companies.

Although material bought in the U.S. may be used to fulfill a DOE enrichment contract that predates Eurodif, one source guessed that the buying was part of an overall strategy that includes stockpiling. The strategy may be similar to how France handled coal purchasing, he said. "They bought very smartly" when prices were low, and then started buying into U.S. coal ventures as prices started to rise. "You look for patterns in these things," he said. "I see one there — potentially at least." The cost of stockpiling may not be as much a consideration for Cogema as it is for a private utility because of its ability to get either government guaranteed loans or direct money, he added.

Cogema would not comment on its strategy. But one source knowledgeable of its activities said Numatec has been querying U.S. utilities for the past six months and planned on buying all it wants by the middle of next year. A key to how long the current spot market situation will last, he said, is interest rates. "One of the reasons it exists is the expense of holding. If interest rates go down . . . they'd (utilities) just sit on it. They're being pushed into the market now because of the cost of money."

In addition to taking advantage of the current excess inventory and low prices, sources say Numatec hopes to create a customer base for Eurodif by relieving utilities of excess inventory. "If Numatec can buy material at the Nuexco price and at the same time be of some service to a utility, why not? It may be good for some future customer relations," said a source. Eurodif, however, has so far been unable to penetrate the U.S. market and its chances for doing it are generally viewed as slim.

SILENCE HALTS TRADE IN RANCHERS STOCK

"Although we are continuing to have discussions about a sale, we would prefer to sell when the price of silver and our earnings move up," a spokesman for Ranchers Exploration & Development told NuclearFuel Oct. 31. The following Monday, uncertainty about prospects for sale of the company led to an overload of sell orders which in turn led the American Stock Exchange to suspend trading in Ranchers stock; that prompted Ranchers to say that completion of a sale has been delayed by the increasing value of its Escalante silver mine in southwest Utah. That increase was not the result of rising silver prices, however, but of drilling, which increased Ranchers' estimate of Escalante reserves about 40% to 33-million ounces of silver.

"We do not believe it to be in the best interest of our

shareholders to rush sale negotiations in light of these new developments," said Maxie Anderson. "While we cannot predict the exact timing or outcome of our discussions with prospective buyers," said Ranchers' president, "we will continue to move forward with these projects and our other operations." That was enough to lift the suspension.

In April, Ranchers announced that it was considering selling after First Mississippi, a Jackson-based fertilizer company, had acquired 21.2% — 650,000 shares — of the Ranchers' common stock at about \$22/share (AP, 13 April, 13). "To give the company an investment position in a successful, but apparently undervalued minerals operation as a hedge against the company's own captive minerals program," said a First Mississippi official, that company might increase its ownership to 25-30% of Ranchers stock.

Ranchers management reacted by announcing that the company was for sale, a move one Ranchers official said was made "to prevent the company from being nibbled to death." Since Ranchers' April announcement, First Mississippi has not moved to increase its share of the company but has told its shareholders it is considering several options: continuing to hold its current shares; selling to any buyer who makes an attractive offer; or adding to its holdings. "We are waiting to see what develops before making a decision," First Mississippi said.

The Escalante mine is expected to reach full production next year, when Ranchers will have invested about \$30-million in its development. For its fiscal year which ended June 30, Ranchers reported a pretax profit of \$5.1 million, down from \$7.1-million for the preceding year. Pretax profit from uranium operations, which are being closed out slowly, was \$2.7-million on sales of \$12.6-million in 1981, up from \$1.2-million on \$10-million in sales for the preceding year.

With a sale in the offing, Ranchers' stock has gone as high as \$65/share in the past year. At the beginning of October it was at about \$41/share; when trading was suspended it stood at \$31.75/share. When trading was resumed, it went to about \$36/share.

ENERGY FUELS SEEN WILLING TO GAMBLE TO WIN LONG-TERM URANIUM CONTRACTS

In today's market, observes an industry analyst, "you can divide producers into two piles — the risk takers and the non-risk takers. . . . You play the market game and bid competitively or you don't have any contracts." Energy Fuels is emerging as one of a handful of producers in the first category, he says, because of its willingness to offer the type of flexible terms Key Lake producers are said to be offering.

That willingness may pay off soon with a long-term contract for 25%-33% of Yankee Atomic's requirements for 7- to 8-million pounds U3O8 through 1990, reliable sources say. The remainder or most of the remainder is expected to be filled from either one or two Key Lake producers (Uranerz Exploration & Mining Ltd. and/or Eldorado Nuclear).

"Ours is a market-oriented contract," says an Energy Fuels source about the type of offer recently made to utilities. "If you know the Canadian contracts you know the type of contracts we have. They're price oriented."

The contracts are said to contain escape clauses for both parties should the price go too high or too low for either,

sources say. "You can almost bet your bottom dollar producers are offering backout clauses in return for being able to deliver from anywhere. If the price goes up, then they're in," says a knowledgeable source. The Energy Fuels source acknowledges that contracts his firm is willing to offer contain "some escapes if prices go too low."

"They're locked in if it goes too high," he says, but force majeure provisions would provide escape for the buyer in some cases, such as if a plant doesn't go on-stream. Essentially, however, if the utility needs the uranium and the price has risen at the time of delivery, "what are they going to do? Everyone else will be high."

The approach Energy Fuels appears to endorse has been criticized by other U.S. producers as "noncontracts" because of the escape clauses. One producer told NuclearFuel recently that while "we are not against escape clauses . . . the kinds of escape clauses that we've seen being discussed . . . are I think a cop-out rather than a solution" because "both buyers and sellers require firm assurance of delivery commitments" (NF, 12 Oct., 9).

The Energy Fuels source acknowledges the contracts are "probably not to a producer's advantage because of the fact you could be selling below your production cost." There "really is no floor" and the contracts contain "conditions for discounts," he adds. But the betting at least as far as Energy Fuels is concerned is that prices won't go much lower. And, adds the source, "as soon as this inventory gets soaked up it'll be a different situation."

PROSPECTING ISN'T WORTHWHILE TO CONOCO IF IT LEADS TO CONVENTIONAL MINING

"By mid-1982 and probably before, we will have closed every conventional facility we have whether we were in production, development or early planning. We will have left one 100%-owned in-situ project in South Texas." That is the outlook of Conoco Inc. as expressed by a knowledgeable Conoco source. Conoco also will retain its 25% share in the Benavides in-situ project in Duval County, Texas, he said, but there are no plans for further conventional uranium production in the U.S.

Without any long-range contracts, "what we're doing right now is simply to look for that part of the business that money can be made in or get out." That means that in 1982 exploration in the U.S. will be severely curtailed and emphasis will be on areas "susceptible to in-situ," he said. Exploration in Niger will continue "at least for the immediate future."

Conoco's entry to the uranium market was "kind of late," the source said, and while its reserve position is strong the "economics are such that none of our conventional mines will stand at today's prices with a reasonable rate of return." In-situ mining is the only possible attraction for future production at this point because capital costs are "much much smaller than capital costs associated with conventional mines." So some pilot plant work will continue at the Ruby Ranch and Borrego Pass in-situ projects, in Wyoming and New Mexico, respectively, although "we haven't even determined whether these are economic," he said.

The Trevino project, which started operating in early October, is expected to produce about 475,000 pounds per year, with full production rate reached by the end of this year.

With about one-quarter's worth of production from the Conquista mine and mill (before it closes in the spring) and a small amount from Benavides, total production next year should be on the order of 600,000-700,000 pounds U3O8.

Like so many other U.S. producers, Conoco sees its future in uranium as a year-to-year proposition. "If the long haul gets to be too long it doesn't make sense for Conoco to go on," said the source.

At the same time, however, the company intends to maintain its reserves, which in 1980 were estimated to be 61-million pounds in the U.S. and 32-million pounds in Niger.

Conoco's last long-term contract, for five years with the Tennessee Valley Authority, ended in 1980 and "it didn't turn out to be a profitable contract" with prices "well below \$20," said the source. "We did not enter into additional long-range contracts for the simple reason that the price started going down."

The company also halted construction of the Crownpoint, N.M. project, a joint venture with Wyoming Mineral Corp., earlier this year (NF, 30 March, 3); announced it would suspend operations at the Conquista project in Texas by next spring and drastically cut production there this year; and indefinitely deferred the Moore Ranch project in Wyoming, a joint venture with Kerr-McGee. Conoco holds a two-thirds share in Conquista, with the other third held by Pioneer Nuclear.

"What we did is cut back in anything that leads to conventional mining in the U.S.," said the source. "Secondly, we're cutting back in exploration in those areas where it would lead to conventional mining." The old mining districts in New Mexico, Wyoming, Colorado and Utah "are too mature" for further exploration under today's market conditions, he said.

Conoco has been laying off workers, mostly miners, since about a year ago. Of a total 750 of them, only about 150 are expected to remain by next spring.

URI PLANS IN-SITU MINING IN WYOMING

Uranium Resources Inc., operator of two in-situ mines near Bruni, Texas, is expanding operations to Wyoming with an in-situ r&d project 13 miles northwest of Douglas. The company says it plans to begin leaching around Feb. 1, 1982 on the property designated as the North Platte Project. The five-well experiment, injecting 20 gallons per minute of leaching solution, will run for about 60 days to obtain data and experience for a commercial plant.

After the experimental leaching, the research and development operation will be closed and the 36 acres restored. Upon satisfactory completion of reclamation, the company will apply to NRC and the Wyoming Department of Environmental Quality for commercial licenses to operate a facility planned to produce between 300,000 and 500,000 pounds of uranium oxide annually.

Mark Pelizza, URI environmental manager, said the company will begin next summer gathering environmental baseline data for the commercial permit applications. "We expect to apply for the licenses in early 1983 and would plan to begin commercial operations in early 1984 depending upon market conditions," Pelizza said.

URI has defined an ore deposit that is amenable to leach-

ing at a depth of 570-600 feet in the Fort Union Formation, Pelizza said. The deposit is in the southern section of the Powder River Basin. URI holds rights to more than 300 acres in the area and is conducting exploration drilling for a possible second in-situ mine.

URI, a subsidiary of Nucorp Energy Inc. of San Diego, Calif., operates the Benavides and Longora in-situ mines near Bruni, and did the engineering and design for another in-situ mine operated in the Bruni district by Tenneco.

SOUTH DAKOTA MAY DROP REQUIREMENT OF PERMITS FOR URANIUM EXPLORATION

Exploration for uranium could proceed without a state permit under a measure tentatively approved Oct. 29 by a South Dakota legislative committee. The Interim Mining Committee endorsed the measure despite objections by some committee members who thought hearings should be held before permitting exploration.

The committee will take a final vote on the measure later this month when it meets to give final consideration to proposed revisions of the state's mining, milling and mineral exploration laws. The requirement of exploration permits can't be eliminated, however, unless the full state legislature approves the plan.

Exploration permits are now required under South Dakota law, but public hearings are held only if the state's Minerals & Environment Board decides they are needed. The proposal under consideration by the committee would allow a company to explore after it notified the state; promised to repair any damage, and cleared its plan with state agencies to make sure the exploration wouldn't harm rare animals or archeological sites.

An alternative proposal to require permits and public hearings for uranium exploration failed on a close vote, meaning the panel might decide later to adopt tougher uranium exploration requirements, according to committee chairman Sen. Homer Harding.

In other action, the committee endorsed Oct. 30 a proposal to have state mining permits cover any milling operations located at mines.

HEALTH DEPARTMENT'S INTERPRETATION OF LAW MAY MOOT LITIGATION OVER CANON CITY MILL

A tangled legal dispute over whether the Cotter Corp. needs a water-discharge permit for its Canon City uranium mill may be unraveled by rulings of the Colorado Supreme Court and the Colorado Department of Health.

Three conservation groups are appealing to the high court decisions denying them standing to bring a suit against Cotter and the Health Department's Water Quality Control Division which had claimed Cotter did not need a permit. At the same time, the Health Department is deciding how to interpret a law adopted by the 1981 Legislature that may make the litigation moot.

The conservationists' suit was filed under a water-quality law which may be superseded by the 1981 statute. The new law does not require a company to obtain a water-discharge

permit if the Health Department determines that the state's Radiation Control Act provides water-quality protection equivalent to or more stringent than the standard in the old law. The department has not yet made the determination.

Meanwhile, the Colorado Court of Appeals last month ordered the State District Court of Denver to conduct a new hearing to determine whether Cotter needs a water-discharge permit. The district court had originally ruled that Cotter did not. However, Assistant Attorney General Rick Griffith says there will not be any further action in the district court until the Health Department settles the equivalency issue.

And meanwhile, Paula Phillips, lawyer for the conservation groups, says she is preparing a petition to the State Supreme Court contending the National Wildlife Federation, the Colorado Wildlife Federation and Citizens for Safe Energy had standing to file the suit. The appeals court held that the groups lacked standing because the water-quality law did not specifically provide private organizations the right to bring suits, but reserved that right to public agencies only. Phillips says her groups contend that the district and appeals courts overlooked the Administrative Procedures Act. "Where a statute does not provide a right of action by a private agency . . . the APA clearly does," she says.

WYOMING LEGISLATURE MAY BE ASKED TO AMEND STATUTE ON RECLAMATION

Wyoming's depressed mining industry, especially the uranium and coal sections, will be the subject of a legislative hearing in Riverton Dec. 4. "We're going to take a look at the whole broad picture," said state Sen. Roy Peck (R-Riverton), chairman of the joint legislative subcommittee named to conduct the inquiry. "The big problem we're having right now is the question: When do you begin final mine reclamation? All the mines have interim reclamation plans during the time the mine is active. The problem that's arisen results from the shut-down of some mines because of economic conditions."

Peck said the state's Department of Environmental Quality has interpreted a temporary mine shutdown as requiring reclamation of mined land. However, "our statutes are completely silent on a suspended or slowed down mine," said Peck. "I personally think we need a statutory change but others think we need a regulatory change."

Peck said the situation is resulting in "tremendous costs to mining companies right at the time they are in financial difficulty. Even the governor says it's idiotic to have the companies fill the pits back up because they will be starting up sometime in the future."

The mining industry, Peck continued, "is being treated uniquely compared with other industries. In Detroit, the auto companies don't have to remove their assembly lines and put the land back to grass just because there's a slowdown in that business."

While the severest impact is on the uranium industry, Peck said, "there's considerable softness in the coal industry too." About 2,000 uranium miners have been laid off in Wyoming during the past 18 months.

Peck said the committee will try to get a precise reading on the industry as a whole at the hearing. He said mining companies, other business interests, environmental groups and the

public at large are being asked to present testimony before the subcommittee.

Recommendations will be prepared by Peck's group for consideration by the Legislature's Joint Mines, Minerals & Development Committee which will meet sometime in January. This panel will determine whether to ask the Legislature convening Feb. 9, 1982 to revise statutes on reclamation or whether to seek revision of regulations by the DEQ.

— *Frank Pitman, Denver*

U.S. MINERS PLUMP FOR IMPORT LIMITS AND HIGHER ENRICHMENT TAILS ASSAYS

Although some doubt that Congress will act, U.S. uranium companies continue to plump for import limits and changes in DOE enrichment policies. Most recently, a dozen companies have urged Congress to tell DOE to amend its enrichment criteria to limit to 20% the fraction of foreign feed a U.S. utility may have enriched by DOE for use in a U.S. reactor, and to liberalize its variable tails policy.

The effects of such changes, the companies tell Sen. Pete Domenici (R-N.M.), should be "early and salutary," and may even save utilities some money.

Domenici, who last year introduced a bill to limit uranium imports, chairs the Senate Energy & Natural Resources Subcommittee on Energy Research & Development. Although the subcommittee held hearings in September on the viability of the U.S. uranium industry (NF, 12 Oct., 4), Domenici is unlikely to push a new bill to restrict imports except as a "signal" to foreign suppliers that the U.S. is prepared to protect that industry.

A signal isn't enough for the 12 companies — Atlas Corp., Cobb Resources Corp., Everest Minerals Corp., Homestake Mining Co., Kerr-McGee Corp., New Mexico & Arizona Land Co., Ogle Petroleum Inc., Pioneer Nuclear Inc., Rocky Mountain Energy Co., Spider Rock Mining Co., Uranium Resources Inc., and Western Nuclear Inc. — who followed up that hearing with a letter to Domenici late last month. Real policy changes are needed, those companies believe.

DOE "need not exempt or 'grandfather' existing enrichment or uranium supply contracts" when limiting foreign feed, the companies said, "because: DOE estimates that less than 15% of total U.S. requirements are being met by foreign material; and foreign supply excesses of individual utilities can be swapped for domestic source material so as to bring each utility within the 20% limit.

"Because of the relatively long contracting and production planning horizons," they concluded, "such a policy will have an early and salutary effect on U.S. contracting activity and development projects. This in turn will help vitalize the industry."

The companies also urged that DOE enrichment customers with requirements and long-term fixed-commitment contracts be allowed, without penalty, to choose the tails assay at which they want their material enriched. "Under present market conditions, adoption of this policy is likely to lead to an increase in uranium demand and a decline in enrichment purchased." Only DOE customers with adjustable fixed-commitment contracts may now vary enrichment tails.

"Enriched uranium presently held in DOE inventories (as a result of the split-tails program) produced at tails above the 0.20% standard transaction assay should be sold on the

basis of actual operational tails," the companies continued. This change "should reduce fuel costs to the utilities because the increase in their feed costs should be more than offset by a reduction in enrichment charges."

Also, the companies concluded, "the vitality of our uranium producing industry and the nuclear industry as a whole cannot be assured without major governmental initiatives to encourage the use of nuclear power and to free the industry from the shackles of misguided overregulation. . . . The policies we have endorsed, if accompanied by such regulatory reform, should help to establish a viable domestic uranium industry. We urge their adoption either by legislation or by executive order."

An official at one of the companies signing the letter, however, said that any push to re-establish new enrichment restrictions would have to come from Congress — something he says he does not expect to happen this year. DOE officials, he said, still maintain that the U.S. uranium industry is viable, and therefore, "we don't expect them to do anything to stop the phase-out of enrichment limitations."

Among the factors making legislation unlikely — in this or any year — are pressure from the U.S. State Department to avoid alienating Canada and Australia, and failure of the U.S. mining community to rally behind its uranium sector. Although it endorsed variable enrichment tails, the American Mining Congress at its recent annual meeting in Denver would not agree to endorse import limits despite an exhortation by Rocky Mountain Energy's E.A. Lang.

Four federal actions, Lang said, would solve the short-term problems of the U.S. uranium industry:

- The Department of Energy should immediately amend existing uranium enrichment criteria by establishing a 20% enrichment limitation on the amount of foreign uranium a domestic utility could use on an annual basis.

- The Nuclear Regulatory Commission, the Environmental Protection Agency and DOE should review all uranium policies, regulations and standards which affect domestic mining. Numerous NRC and EPA regulations are "cumbersome and extremely costly" and provide no added protection to the public, he said.

- The Reagan Administration should develop a clear, positive and consistent policy toward nuclear power in the U.S. The federal government should make every effort to send this signal by expediting nuclear licensing, establishing a federal nuclear waste program and re-establishing a reprocessing program consistent with national needs.

- Current enrichment policy should be amended to increase the tails assay from 0.20% to 0.28%. This would have the immediate effect of increasing uranium demand by as much as 10-20%. The 0.28% tail "is considered by many to be the optimum based on the present price for enrichment and conversion services."

Lang said he disagreed with a DOE assessment that "the industry is currently viable." Lang said, "Contrary to the DOE conclusion, I maintain that the domestic uranium industry is not viable. Given the dramatic slowdown in U.S. nuclear power development and the nearly 60% decline of domestic uranium prices since 1979, it is understandable that the domestic uranium industry has: 1. laid off over 8,000 of 22,000 workers; 2. limited domestic exploration activities, and 3. significantly reduced capital expenditures."

Lang said, "While domestic uranium production reached

peak levels in 1980, it has fallen substantially throughout 1981 and can be expected to drop during the late 1980s and 1990s to levels insufficient to meet total U.S. requirements."

Current import commitments by U.S. utilities are relatively low, Lang said. "However," he added, "foreign uranium will assume an increasing share of U.S. requirements as pressure mounts from consumer advocates and state public utility commissions to purchase the lowest-cost uranium available." He noted that recent discoveries in Canada and Australia "are very high grade and low cost. Uncommitted, planned production from Australia and Canada could supply a total of 15,400 tons to the United States in 1990 — this amount exceeds domestic unfilled requirements of only 11,600 tons in that year."

CRITIQUE OF IAEA SAFEGUARDS GETS SKEPTICAL RECEPTION IN WASHINGTON

A classified paper critical of International Atomic Energy Agency (IAEA) safeguards currently is under review by officials in several U.S. agencies. Sources say it was written by an NRC staff person who worked in the agency's Euratom section three or four years ago, has expertise in reprocessing safeguards, and who may have recently left NRC.

"The implication is he felt a need to write it," said one source. That source questioned the need to designate the report "secret," however, and said, "We find it interesting the author's name is deleted." Another source said the report "just seemed to be grossly out of date," because the author had been "out of the business for several years. That's why I didn't take it seriously."

Among the charges in the paper, about 20 pages long, are that inspectors could be dismissed for reporting violations, and that fuel and component transfers from facility to facility outside the U.S. (for example, in Japan) are not well documented, sources said. Another charge is that countries with enrichment plants are not providing information needed for adequate safeguards.

One source who read the report and is knowledgeable of the IAEA system said that while there were built-in biases against reporting violations, it is not true that an inspector could be fired for reporting a violation. The criticism about enrichment is "misleading," he said, because enrichment safeguards are still under development. However, he said, you can't "repudiate the whole thing. He's got some points in there."

Another source said, "I don't believe an inspector would lose a job for reporting information." He said that the interface between inspectors and IAEA management had improved a lot since the paper's author was at the IAEA. "IAEA has its shortcomings but they're exaggerated in this report." He added that the report is "nowhere near as devastating" as the Senate testimony given by Roger Richter, who resigned in June as an IAEA inspector. Richter's testimony was more facility-specific whereas the recent paper concentrates more on the management system, he said. "In an international organization it's much worse than government or private business." But these are "generic problems . . . the problems of an agency staffed by nationals." Several studies on IAEA safeguards are under way, but whether this paper will be used for them is unclear. "It'll just be sort of absorbed," one source predicted.

JAPAN EXPECTED TO OPPOSE INSPECTORS INSIDE CENTRIFUGE CASCADE HALLS

Japan is expected to take a strong stand this week against access by safeguards inspectors to cascade halls at centrifuge enrichment plants; that position would be taken during the first annual review in Tokyo (Nov. 2-14) of a project aimed at developing stronger safeguards for such facilities. Participants in the "hexapartite safeguards project" have another year to mull over various approaches (if they are to meet their goal), but such a stand by Japan at this point would not be surprising, according to a U.S. official, since the four other countries involved with Japan and the IAEA in the project — the U.S., the U.K., the Netherlands and West Germany — have so far been reluctant to endorse such access.

At the same time, however, none of those countries appears ready to reject the idea of access, and, in the U.S. at least, officials still are wrestling with the pros and cons of admitting or not admitting inspectors to cascade halls.

The aim of the two-year project is to develop and facilitate "effective and efficient international safeguards" for use at centrifuge plants by the IAEA, a U.S. official said. The agency currently monitors feed and product streams at the Almelo enrichment plant in the Netherlands, and at Japan's Ningyo Pass plant, and could do the same in the U.S. when the Portsmouth plant starts operating. But knowledgeable sources say feed and product measurements might not detect clandestine development of high-enriched uranium (HEU) within a cascade hall, especially in a large operation, so the hexapartite safeguards project was started.

One source noted that the potential for HEU production is much greater in centrifuge plants than in diffusion or nozzle separation facilities because of the relative ease with which cascades in centrifuge plants can be connected to increase enrichment. But the project's focus on safeguarding centrifuge plants is because of the IAEA's lack of access to other types of facilities, rather than the relative risk of centrifuge plants as proliferators. A U.S. official said technology under development for the project could be applied to other types of plants with some adjustments.

To facilitate HEU detection without inspector access to cascade halls, the U.S. and Japan both have developed monitors to detect neutron and gamma-ray emissions of the level that would occur if such material were being produced. The monitors could be placed inside or outside the halls, although U.S. officials say that without some form of physical inspection it would be difficult to determine whether the monitors were shielded or otherwise tampered with.

Japan, however, intends to urge utilization of a neutron monitor developed by the Power Reactor & Nuclear Fuel Development Corp. (PNC), and as a first step to urge testing of the monitor to confirm its effectiveness. PNC apparently wants the monitor placed outside the hall, according to one source, who said, "The machine had better be placed as far from the cascades as possible."

U.S. officials hold the view that there are tradeoffs between strong safeguards, the desire to protect technology, and costs. The cost of the nonaccess approach is generally thought to be higher because of the extensive backup measuring instruments that would be required.

"Both the access and nonaccess approaches should be

given a thorough technical evaluation," said one U.S. source. "Probably the preponderance of technical opinion is that the access solutions or strategies are superior with respect to the effectiveness and efficiency of safeguards." That doesn't resolve the problem of limiting technology transfers, however, and "that's the basic quandary of hexapartite — how to have effective safeguards without making states concerned about technology transfers either for commercial or proliferation reasons."

By next November "the goal is to come up with some sort of an inspection method which would satisfy both the IAEA and the states involved," said another source. An early push by the Japanese against the access route is not surprising when one considers that the U.S., "which prides itself on being at the forefront of safeguards, hasn't taken a stand."

Urenco officials would not comment on their involvement in the project other than to say they were lending technical advice and support. One source said the enrichment consortium was weighing several approaches. Japanese and U.S. sources said they believe Urenco has not developed remote monitoring devices for a nonaccess approach, however.

The U.S. program, budgeted for about \$2-million/year, is headed by DOE's Office of Safeguards & Security. Union Carbide Corp.'s nuclear division at Oak Ridge is coordinating the project, drawing on services from the Los Alamos, Sandia and Brookhaven national laboratories. Primary work on the neutron and gamma ray monitoring devices is being carried out at Los Alamos, sources said, with some work at Oak Ridge. In Japan, PNC has undertaken the bulk of safeguards r&d, spending about \$1.5-million in FY-81 (ending March 1982), out of a total \$2.5-million budget.

DOE WARNED SENATE WON'T ALLOW IT TO GET WEAPONS Fu FROM COMMERCIAL SPENT FUEL

The U.S. Senate sent "an urgently needed signal to DOE and the rest of the world," according to Sen. Gary Hart (D-Colo.), by adopting by voice vote Nov. 4 an amendment to the energy & water appropriations bill for fiscal 1982 that would prevent DOE from using any funds to obtain commercial spent nuclear fuel for use in nuclear weapons.

That signal, said Hart, is that "under no circumstances will the United States undermine international efforts to halt the spread of atomic bombs by diverting plutonium from its own commercial nuclear power program to build nuclear weapons." The amendment would not affect DOE's FY-82 program because the appropriations bill provides no funds for this purpose. But Hart said that if the Senate did not send a signal "DOE will begin to base its contingency planning on the availability of this truly unfortunate proposal, and we will have unnecessarily and tragically defeated ourselves in the ceaseless battle against nuclear proliferation."

Sen. Bennett Johnston (D-La.), the Democratic floor manager of the bill, agreed, saying: "I think the senator makes a point, that this is no time to let the suspicion creep in that these funds will be used for that purpose, because paranoia is rather great in the international nuclear political field. This is the kind of assurance we can give, which perhaps will help dampen down some of the paranoia that is sweeping some of our Nato allies at this time."

DOE officials in congressional testimony have main-

tained that they are looking at commercial spent fuel as one of several additional sources of plutonium for the weapons program. To make use of commercial spent fuel, it would first have to be reprocessed to obtain plutonium and then the plutonium would have to be purified using a special isotope separation technology, expected to be ready in 1987, DOE officials said.

In a related matter, Hart and Sen. Charles Percy (R-Ill.) introduced a bill, S.1812, Nov. 4 that would prohibit NRC from licensing the transfer of spent fuel from commercial power plants to DOE for use in making nuclear weapons unless Congress by joint resolution approved such a license.

In the House, Rep. James Weaver (D-Ore.) was successful in getting the Interior & Insular Affairs Subcommittee on Energy & the Environment to adopt as part of the nuclear waste bill, HR 3809, now before the full committee, a provision that would prevent commercial spent fuel from being transferred to DOE for use in nuclear weapons.

BELGIANS GET 'LAST DEADLINE' FROM EUROCHEMIC

The Eurochemic board of directors late last month granted Belgium an 18-24 month reprieve in which to decide whether or not it will take over the Eurochemic plant and resume reprocessing at the site in Mol. The facility was to be turned over to Belgium at the end of this year, but the inability of the Belgian government to bring the reprocessing question before Parliament has blocked action (NF, 26 Oct., 7).

The board's decision was unanimous, said an informed source, but he added that "this is the last deadline" for the Belgians. Belgium and Eurochemic signed a 1978 accord that called for transfer of ownership by the end of 1981.

The board remains firmly committed to executing the 1978 agreement, but is now asking the Eurochemic administration to reach another agreement with Belgium on the specific means of transfer to be accomplished within the next two years. In the interim, Eurochemic will also continue the medium-level-waste conditioning program at Mol.

DWK SEEN MOVING SOON TO LICENSE REPROCESSING PLANT IN BAVARIA

Although it continues to talk with U.S. officials about buying into Allied-General Nuclear Services' Barnwell plant, West Germany's Deutsche Gesellschaft fuer Wiederaufarbeitung von Kernbrennstoffen mbH (DWK) will probably soon embark upon licensing procedures for a 350-tonne/year reprocessing plant near Schwandorf in Bavaria. Only three days after the Bavarian state government agreed late last month on site criteria for a reprocessing plant, DWK announced that Schwandorf looks "basically suitable." Provided that closer examination of the tentatively chosen location does not produce unpleasant surprises, DWK will in early 1982 launch a site suitability procedure which, in case of a positive outcome, would be followed by a licensing procedure. If all went well, a construction permit could be awarded in the mid-1980s.

Bavaria is the third West German state which has drawn up site criteria for a reprocessing plant, thereby signalling basic readiness to house such a project. The other two are Hesse and Rhineland-Palatinate. DWK has not picked a site yet in Rhine-

land-Palatinate and the location it had selected in Hesse, near Wethen, was rejected by the Hesse government last summer for geological reasons; but DWK hopes to be more successful with another site which it will propose to Hesse authorities later this month. According to a DWK spokesman, the company still feels it can meet its original timetable in Hesse, with start of construction in 1985 and completion in 1992 or '93.

Construction cost is estimated at DM 6- to 8-billion for a 350-tonne/year plant whose capacity is tentatively planned to be doubled at a later stage.

LEU TEST SET TO BEGIN AT FORD REACTOR

A full-core demonstration of low-enriched uranium (leu) fuel is set to begin in several weeks at the University of Michigan's 2-Mwth Ford reactor to see what will happen to the core and to demonstrate that such fuel can safely be licensed. The test is part of the U.S. Reduced Enrichment Research & Test Reactor (RERTR) program, and will be carried out with fuel from West Germany's Nukem and Compagnie pour l'Etude et la Realisation de Combustibles Atomiques (Cerca), France's research reactor fuel fabricator.

Complete results on leu fuel-core behavior should be available in four years, allowing high-density leu fuel fabrication, according to J.L. Snelgrove of Argonne National Laboratory, who discussed the RERTR program at a recent IAEA seminar on research reactors in Juelich, West Germany. In less time, about two years, he said, results on medium-density fuel, sufficient for many research reactors, should be available.

The Ford experiment is scheduled to be completed by March 1982 and analysis of the results should take a year, Snelgrove said. A second full-core demonstration is planned for late 1983 at the Oak Ridge Reactor (ORR). For this verification of a leu core, "a relatively high-powered, high-duty-factor reactor such as the ORR is needed to efficiently conduct this demonstration," he said.

Other significant developments in leu fuel also were presented at Juelich. Cerca reported that it achieved satisfactory results with a 23-plate fuel element loaded into the Siloe reactor at Grenoble in February and removed after six months. The fuel contained 2.2 grams per cubic centimeter of uranium, a higher density than the approximately 1.5 g/cc uranium fuel elements shipped to Japan by Cerca earlier this year. No fuel failure was detected during the tests.

Cerca director Bernard Savornin told NuclearFuel the firm is very encouraged by the results at Siloe and sees a "climb in performance." That means attaining a level of about 5 g/cc of uranium to bring the enrichment level down to 19.95%, he said. In 1982, or early 1983, Cerca is planning to load elements containing 3.2 g/cc uranium into reactors in France, Oak Ridge and the Netherlands (HFR Petten), Cerca scientists said at Juelich. Those elements will have U3O8, while a number of earlier experiments used uranium-aluminum fuel.

Both Cerca and Nukem are working on fuel elements using uranium-silicide fuels. This different chemical configuration allows even higher densities of uranium. Nukem is working on fabricating full size fuel plates with 4.7 g/cc of uranium, and Cerca said full size plates "containing up to 6.6 g/cc of uranium have been successfully fabricated." In addition to its other deliveries to Oak Ridge, Cerca is preparing two fuel elements

DOE MAJOR ENRICHMENT WORK SEPTEMBER 1981

Kg units of sep. work	Dollars	Enriching customer	End use
49,159	5,849,921	BKW	Muehleberg
171,674	18,884,140	Euratom	Unterwasser
30,963	3,405,930	Euratom	Isar (Ohu)
16,561	1,821,710	KGD	Goesgen
92,561	10,181,710	KKL	Leibstadt
21,160	2,518,040	OKG	Oskarshamn-1
65,920	7,844,480	Swedish SFB	Ringsals-2
187,865	22,355,935	Baltimore G&E	Calvert Cliffs-1
17,946	2,135,574	Charlotte P&L	Brunswick-2
120,509	13,255,990	Charlotte G&E	Zimmer-1
202,087	22,229,570	Comb. Engineering	St. Lucie-2
3,524	387,640	C'wealth Edison	Dresden-2
55,526	6,607,594	C'wealth Edison	Zion-1
15,323	1,685,530	Duke Power	LaCrosse
104,837	11,532,070	Duke Power	Oconee-1
97,350	10,708,500	Duke Power	Oconee-2
117,710	12,948,100	Duke Power	Oconee-3
13,731	1,510,410	Florida P&L	Turkey Point-4
35,205	3,872,550	GE	Monticello
309,180	34,009,800	Kansas G&E	Wolf Creek-1
64,464	7,091,040	Nebraska PPD	Cooper
49,022	5,392,420	Northeast Utilities	Millstone-3
101,002	11,434,336	Pennsylvania P&L	Susquehanna-2
21,157	2,517,683	Phil. Electric	Peach Bottom-2
114,505	12,595,550	P.S. New Hampshire	Seabrook-2
3,027	332,970	P.S. New Hampshire	Whouse working stock
211	23,210	P.S. New Hampshire	Switzerland misc. research
651	71,610	P.S. New Hampshire	AVR
4,364	480,040	P.S. New Hampshire	Japanese misc. research
2,503	275,330	P.S. New Hampshire	German misc. research
3,459	380,490	P.S. New Hampshire	Sweden misc. research
295,953	32,554,830	P.S. Indiana	Marble Hill-1
21,856	2,404,160	Rochester G&E	Ginna
2,803	308,330	Rochester G&E	Exxon working stock
8,559	941,490	Swaco	Canadian misc. research
62,487	7,435,953	TVA	Browns Ferry-2
2,211	243,210	Texas Utilities	Comanche Peak-2
125,221	14,901,299	Virginia E&P	North Anna-2
267,372	29,410,920	WPPSS	WNP-3 (Satsop-1)
363,825	40,020,750	WPPSS	WNP-4 (Hanford)
52,561	5,781,710	Wisc. Electric	Point Beach-1
65,186	7,757,134	Wisc. P.S.	Kewaunee
<u>3,361,190</u>	<u>376,099,659</u>		
121,109,869	7,385,930,334	Cumulative to date	

for mid-1982 containing the silicide type fuel at 4.8 g/cc uranium.

Fuel fabrication costs of leu could be as much as double the cost of high-enriched uranium (heu) fabrication, according to another Cerca paper, because of the additional uranium required plus refinement and preparation. But, the analysis continued, costs can be somewhat compensated in actual reactor operation. Here, using core conversion examples for 2-Mw and 10-Mw reactors, Cerca said that by measuring the performance

of leu elements in terms of cycle life, neutron production rate, or burnup, costs can be brought down.

For example, if a 23-rod heu fuel element, with 0.68 g/cc of uranium, has a base price of \$100, then a similar sized assembly of uranium silicide composition with 3.59 g/cc uranium would cost \$147. When considered this way — in terms of operations rather than just fuel fabrication — leu costs should run 40%-50% higher than heu. But he said it is difficult to generalize and stressed the fuel fabricator and reactor operator must work closely to take into account the specific criteria of each reactor.

From the United States, Robert Cheswoth and Gordon West of General Atomic's Triga reactor division said the final demonstration of Triga leu is under way at Argonne National Laboratory and that the firm has "terminated all production of uranium-zirconium hydride fuel enriched to levels greater than 20%." Snelgrove of RERTR told the meeting that a co-operation agreement with Rumania should be signed soon, allowing for a demonstration of Triga leu fuel elements in the core of the Rumanian steady-state reactor.

— Douglas Glucroft, Paris

HOUSE REJECTS HEU EXPORT BAN

By a vote of 293 to 100, the House Nov. 5 turned down an amendment offered by Rep. Edward Markey (D-Mass.) that would have prohibited the export of uranium enriched to greater than 20% U-235. Markey maintained that exporting the fuel for use in research reactors increases the possibility that the material could be diverted or stolen to make nuclear bombs. Rep. Jonathan Bingham (D-N.Y.) opposed the amendment — which was offered to NRC's FY-82 authorizations bill — because no hearings had been held on it. An aide to Bingham said the measure was "precipitous," and might needlessly offend U.S. allies.

GAO CONTINUES TO WEIGH ENRICHMENT PLANS

The General Accounting Office is taking yet another look at DOE's enrichment business, again with an eye for whether the Portsmouth gas centrifuge enrichment plant should be built. This time the study is for Rep. Richard Ottinger (D-N.Y.) and will focus on various options for supplying enrichment services in the late 1980s and in the 1990s. GAO officials say they hope to have the report ready in time for hearings that Ottinger, chairman of the House Energy & Water Subcommittee on Energy Conservation & Power, plans for next March.

According to GAO officials, the study will examine a number of questions including whether there is a need to build both GCEP and a plant using an advanced isotope separation technology (AIST). In several past reports, GAO has said that DOE should consider building an AIST plant rather than GCEP for new increments of enrichment capacity (NF, 25 May; 1). Building both, though, may be justified, GAO officials now say, because of the need to retire the high electricity consuming gaseous diffusion plants.

On the other hand, GAO officials say, while reducing power costs by building both may lower swu charges for enrichment customers, such a course of action may not result in sig-

nificantly lower electricity costs for U.S. consumers. Therefore, the large near-term construction costs of GCEP may not be justified in DOE's annual budgets, GAO officials say.

In addition to preparing a report for Ottinger, GAO officials say they expect to complete, within a month, a report analyzing a bill introduced by Reps. Manuel Lujan (R-N.M.) and Marilyn Lloyd Bouquard (D-Tenn.) that would establish a revolving fund structure for DOE's uranium enrichment enterprise.

SENATE'S NEW BUDGET-CUTTING MOVE THREATENS TO KILL GCEP, DOE WARNS

DOE will be forced to cut an additional \$70-million from its FY-82 budget for the Portsmouth gas centrifuge enrichment plant (GCEP) if a bill passed by the Senate Nov. 4 is enacted. DOE officials warn that a cut of this size would delay the project one year. This in turn could cause a number of key GCEP contractors to drop out of the project, and if this should happen "seriously consideration would have to be given to terminating the project," according to Shelby Brewer, DOE assistant secretary for nuclear energy.

Industry and congressional supporters of the project hope to have a good part of the funds restored when a House-Senate conference committee meets to iron out differences between the Senate and House-passed bills.

The Reagan Administration originally requested \$669-million for GCEP in FY-82 and the House in July passed a bill appropriating \$600-million for it. DOE officials said that cut would have little impact on the schedule for the program, which calls for the first 1.1-million swu of capacity to be ready in 1988. The House cutback would only have forced contracts scheduled to be awarded in the fourth quarter of FY-82 to be deferred until FY-83.

The Senate Appropriations Committee, under pressure to make further budget cuts, made an additional \$90-million general reduction from the House allowance for uranium enrichment activities.

Although report language said the cut should be "prudently allocated," Brewer, in a letter to Sen. John Glenn (D-Ohio), said "the additional \$90-million reduction will have to come predominantly from GCEP as all other activities are at their lowest operational level. We currently estimate that at least \$70-million of the \$90-million will have to be taken from GCEP.

"A \$70-million reduction in GCEP on top of the (House's earlier) \$68-million reduction will have severe impacts," Brewer continued. "The reduction will require moving 15 to 20 construction and procurement packages to FY-83 which will delay GCEP completion by up to one year. A number of contracts will have to be renegotiated and together with the project delay will result in increased cost, by at least \$125-million over the next few years, to construct the plant and a delay in realizing the economic benefits from GCEP operations.

"Finally, experience from the project's delay in FY-81 indicates that several key contractors will have to reassess their involvement in the project. Should they choose not to continue with the project, serious consideration would have to be given to terminating the project."

In hopes of establishing a better position in the conference committee to restore some of the cut, Glenn and Sen.

Howard Metzenbaum (D-Ohio) engaged in a carefully planned colloquy with Sen. Mark Hatfield (R-Ore.), floor manager of the bill and chairman of the Senate Appropriations Committee. The colloquy was intended to flesh-out what exactly the committee meant by making the general reduction of \$90-million in enrichment revenues. According to the script, Hatfield was to agree "that the allocation of any general reduction by DOE should be performed in a way that is cost-effective and will not result in significantly greater costs for DOE programs in the future."

SENATE IS CLOSE TO HOSUE ON MILL RULES BUT DIFFERS ON TAILINGS CLEANUP AND LEU

House and Senate conferees will have to iron out a number of differences in their versions of the FY-82 energy & water appropriations bill, following passage by the Senate of its version Nov. 5 on a 71-22 vote. The Senate bill contains a major slash in DOE's uranium enrichment program, as well as differences in funding for the uranium mill tailings cleanup program at inactive sites, construction of a second naval nuclear fuel facility, and DOE's program to promote conversion to low-enriched fuel at research reactors. The Senate version also contains a modified version of the so-called Stratton amendment which would bar NRC from using funds to enforce its year-old mill tailings requirements.

Under the bill, DOE's Office of Uranium Enrichment & Assessment (OUEA) would receive a net appropriation of \$6-million, compared to the \$88-million provided by the House. The amount is based on a total budget of \$1.901-billion, less anticipated enrichment revenues of \$1.805-billion, and less "a general reduction" of \$90-million asked for by the Senate Appropriations Committee. A committee report accompanying the bill said the appropriation should be "prudently allocated so that, to the extent possible, there is minimal impact on production capability."

The bill does not provide the \$6-million provided by the House to begin work on a development module for an advanced isotope separation (AIS) technology, putting that money instead into general AIS operating expenses. But, like the House version, the Senate bill recommends only \$9.7-million for the national uranium resource evaluation program (NURE), compared to about \$30-million budgeted in FY-81.

An AIS technology is scheduled to be selected next April for further development, but the committee report called the House funding for development "premature," and said it "should not be provided until the process selection has been completed. The committee encourages the department to proceed with the process selection only after all essential technical data has been completed and fully analyzed."

The report also directed DOE to take prompt action to prevent demand payments — which total \$166-million in the DOE FY-82 budget — from becoming substantially larger in future years. The payments are for electricity contracted to operate DOE's gaseous diffusion plants but not taken because of a reduced level of operation.

The Senate's version of the bill would give DOE's reduced enrichment in research & test reactor (RERTR) program \$5-million to operate in FY-82, compared to \$3-million recommended by the House. The report accompanying the bill said

CURRENT URANIUM PRICING INDICATORS (U.S. \$/lb U3O8)

Source (date)	Price	Last report (date)
DOE (as of March 1981) ¹	42.71	43.74 (Jan. 1980)
Nuexco (Oct. 31, 1981) ²		
Exchange value	23.50	23.50 (Oct. 1981)
Transaction value	24.10	23.90
Nukem (Oct. 1981) ³	23.50- 25.50	23.50- (Sept. 1981) 25.50

1. DOE sells uranium in emergency cases only. Its list price, established exclusively for this purpose, is a weighted average based on identifiable spot-price sales and market-price contract settlements in the year prior to the reporting date.
2. Nuexco's *Exchange Value* reflects the company's judgment of the price at which sales of significant quantities of yellowcake could be concluded as of the reporting date. The *Transaction Value* is a weighted average price derived from recent sales for which delivery is scheduled within one year of the transaction date.
3. Nukem's price range reflects bids and offers for natural uranium on the international market during the reporting month.

URANIUM GOVERNMENT INDICES USED AS U3O8 CONTRACT ESCALATORS¹

Index (date)	Value	Last report (date)
GNP implicit price deflator (Sept. 30, 1981) ²	195.40	191.06 (June 1981)
Producer price index — Industrial commodities (Sept. 1981)	307.20	307.00 (Aug. 1981)
Gross avg. hourly earnings, production/nonsupervisory workers		
Metal mining (July 1981)	11.63	11.31 (June 1981)
Primary nonferrous metals (July 1981)	12.13	11.88 (June 1981)
Chemicals and allied products (Aug. 1981)	9.22	9.14 (July 1981)

1. Except for the GNP figures, data incorporated in this table are compiled and published by the U.S. Bureau of Labor Statistics. The base year for the Producer Price Index is 1967 (assigned a value of 100.00). Current figures are subject to later revision by the bureau.
2. The *GNP implicit price deflator* is computed on a quarterly basis by the U.S. Dept. of Commerce, using 1972 as the base year (100.00). The current value is the seasonally adjusted figure for the second quarter of 1981; the previous value, that for the first quarter of 1981.

the increase is warranted because the RERTR program, which "has gained broad international support," is designed to promote development of new fuel technology which will reduce proliferation risks.

The Senate version provides \$22-million for cleaning up mill tailings on inactive sites, \$8.8-million above what the House would allow, but still under the \$30.3-million requested by the administration. The committee's explanation was that the amount would "allow continuation of important ongoing remedial action activities." Its reluctance to provide the full

amount reflects the "growing concern with agency efforts to develop standards for the program."

The bill modifies the so-called Stratton amendment to the House version, which would prevent NRC from using funds to enforce its mill licensing requirements published Oct. 3, 1980. The committee agreed with the House that NRC should not have adopted technical requirements for uranium mill tailings disposal prior to EPA's promulgation of final environmental standards. But under the Senate amendment, "NRC would retain its authority to regulate uranium mill tailings on a case-by-case basis in the manner and to the extent permitted prior to the promulgation of its uranium mill licensing regulations. Thus, the commission would retain the authority to impose through license conditions those requirements for the management of uranium mill tailings that the commission can demonstrate in each case are necessary to protect the public health, safety, and the environment. . . .

"NRC would retain the authority to enter into an amended state agreement if the revised state uranium mill licensing program meets all other requirements of (the Uranium Mill Tailings Radiation Control Act of 1978). However, during the period in which NRC is prohibited from enforcing the technical requirements in its regulations, it would lack the authority to require any state to adopt comparable requirements in order for the state to continue to exercise authority under state law for uranium mill licensing."

Adm. Hyman Rickover would receive \$15-million — \$12-million more than the House — under the bill to begin construction of a second naval nuclear fuel facility at Savannah River. That would preclude dependence on the only current source of such fuel, the Nuclear Fuel Services' Erwin, Tenn. plant. "Reliance on a single source of fuel poses an unacceptable risk to the naval combatant fleet," the committee report says. — *Michael Knapik, Washington*

ARGENTINA IS SEEKING BIDS FROM MINING COMPANIES

for exploration and development of the Tigre I sector of the Baulies uranium field at Sierra Pintada, Mendoza Province. CNEA (Comision Nacional de Energia Atomica), which asked for the bids, estimates that the resulting contract will be for about \$2.5-million. CNEA will buy any future uranium product at mutually-agreed prices. This is intended to be the beginning of development of Sierra Pintada, which was delayed when the \$150-million planned mine-mill complex project fell through earlier this year because of financial problems of the participat-

ing consortium (NF, 25 May, 12). This larger project was put on hold in the wake of the heart attack suffered by CNEA President Carlos Castro Madero.

GULF LOSES INSURANCE PREMIUMS SUIT

Harrison Western Corp. of Salt Lake City, builders of the Mount Taylor uranium mine in New Mexico for Gulf Mineral Resources, won a decision by the U.S. 10th Circuit Court of Appeals in a dispute over \$206,190 in workmen's compensation insurance premiums.

Gulf had deducted the \$206,190 from a \$300,000 performance bonus the contractor had earned July 1, 1979 in construction of the Mount Taylor underground mine northwest of Grants in Valencia County. Harrison Western had received lower adjustments to premiums based on its favorable safety record.

The construction contract provided that Harrison Western was to obtain the insurance and would be reimbursed the costs by Gulf. A key phrase in the contract said, "It is agreed that the term 'reimbursable costs' shall not include any adjustments under retrospective rating or similar type insurance plans. Owner will not participate in any such adjustments, whether they increase or decrease the premiums of any insurance by the contractor. . . ." Harrison Western's bills to Gulf did not reflect the adjustments received by the contractor.

Harrison Western brought suit in the U.S. District Court for New Mexico to recover the \$206,190. The appellate court affirmed the lower court's ruling in favor of the contractor. The New Mexico court decision said: "A review of the contract leaves the impression that Gulf did not wish to expose itself to the risk of fluctuating premiums. By fixing its premium expense at a definite amount, Gulf shifted to Harrison the risk of higher premiums. Gulf, therefore, should not be permitted to reap the benefit of lower premiums occasioned by Harrison's improved safety record."

GULF MINERAL RESOURCES IS LAYING OFF about 100 workers in the production and maintenance departments at its Mount Taylor uranium mine near San Mateo, N.M. Gulf spokesman Fred Meurer said his company is reducing the number of work shifts at the mine from 21 to 15 per week. Meanwhile, construction is continuing on new facilities at the mine.

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